1. What are the similarities and differences between prokaryotes and eukaryotes? Give an example of each type of organism.
2. Distinguish between the following levels of organization in a living thing: cell, tissue, organ, organ system, organism, population, ecosystem, biosphere.
3. Define biotic and abiotic. Give examples of each.
4. Explain the major parts of the water and the carbon cycle. Where is human impact a major disruption in these cycles?
5. Define species. How does evolution and genetics change the alleles within a species?
6. What are the steps of mitosis? How is mitosis important?
7. What are the steps of Meiosis? Why is meiosis important?
8. Explain the difference between haploid and diploid.
9. Why is meiosis an advantage to the survival of a species?
10. What are the categories (taxa) in classification?
11. What is a hypothesis, theory, law, inference, or deduction?
12. Explain cell specialization (differentiation.) When does it occur and why is it important?
13. What particles are found in an atom? Describe their location and charge.
14. What are the 3 main elements found in the major biomolecules?
15. What are the 4 major biomolecules and what are their importance in living things?
16. What element is found in proteins that are not found in the other biomolecules?
17. An enzyme is which type of biomolecule? An enzyme is a catalyst, what does it do?
18. Define ecology, classification, and genetics.
19. What is the difference between a producer, herbivore, omnivore, carnivore, decomposer, and detritivore?
20. Describe the movements of nutrients and energy throughout the biosphere.
21. What is the greenhouse effect?
22. What is the difference between niche and habitat?
23. What are some things that control the populations of organisms in an ecosystem?
24. Distinguish between mutualism, parasitism, commensalism, and predation.
25. What is the difference between primary and secondary succession?
26. What is carrying capacity?
27. Distinguish between plant and animal cells.
28. What are the major structures found in the cell membrane?
29. Distinguish between diffusion, osmosis, and active transport.
30. What happens to a cell placed in a hypertonic solution? A hypotonic solution?
31. What is homeostasis? Provide some examples.
32. What are pigments and their functions? How can you tell the colors of light they absorb?
33. What is the equation for photosynthesis? What are the reactants and the products?
34. Distinguish between the light and dark reactions?
35. What are stomata and their function?
36. Distinguish between xylem and phloem.
37. What is the equation for respiration? What are the reactants and the products?
38. What cell parts are required to carry on respiration or photosynthesis?
39. Distinguish between glycolysis, the krebs cycle, and electron transport. How much energy is made in each process?
40. What is the difference in energy, products, and location of anaerobic and aerobic respiration?
41. Why are cells so small?
42. Why are there two alleles for each trait? What happens if there is a dominant or recessive alleles present?
43. Distinguish between homozygous and heterozygous alleles.
44. What is the difference in chromosome number, number of cells, and the processes in mitosis and meiosis?
45. What particular processes occur in Meiosis to create genetic variety in the sex cells?
46. What is a linked gene?
47. Describe the structure of DNA. What are the monomer units of DNA? Which nitrogen bases pair together?
48. What is the difference between DNA and RNA?
49. Describe how proteins are made.
50. Distinguish between a gene and chromosome mutation.
51. What is a sex-linked gene? Give an example.
52. What is an advantage of genetically modified organisms?
53. What would determine whether a mutation is passed along to new generations (increase in frequency of the allele.)?
54. Which kingdoms contain organisms with cell walls?
55. Why is nitrogen fixation important?
56. What is the meristem of a plant? What tissue protects it?
57. What is the function of the following tree structures: heartwood, sapwood, cork cambium?
58. What are the unique properties of water? How do they support life?
59. What are the three stages of the cell cycle?
60. What are the sources of evidence for evolution?